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WHAT IS CLAIMED IS:

5 1. In a suborbital spacecraft having a fuselage with a generally central and open interior cylindrical surface, a hybrid-rocket propulsion system, comprising an oxidizer tank having an outer and central cylindrical surface covered by a skirt, and insertable within the fuselage interior surface, the skirt and tank being secured together by an elastomeric means, and an outer surface of the skirt being adhesively secured to the fuselage interior surface; an elongated and generally cylindrical solid-fuel motor case rigidly secured to a central rear surface of the oxidizer tank, the case having a rear end defining a throat, and a nozzle extending behind the fuselage; and wherein the sole support for the propulsion system is said elastomeric means, the case being cantilevered behind the tank, and free of direct attachment to the fuselage.

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25 2. The propulsion system of claim 1, wherein the tank has an inner liner of an epoxy-fiberglass composite material, the inner liner being overwound with an outer layer of graphite-fiber tow and an epoxy matrix.

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30 3. The propulsion system of claim 2, wherein the skirt is fiberglass.

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35 4. The propulsion system of claim 3, wherein the elastomeric means is a layer of an elastomeric adhesive bonding the skirt to the tank.

35 5. The propulsion system of claim 4 wherein the elastomeric adhesive has a thickness of about 0.1 inch.

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6. The propulsion system of claim 2, wherein the tank inner liner and outer layer are wound around and secured to forward and rear flanges, the flanges in turn being secured to forward and rear bulkheads respective, the bulkheads sealing the tank.

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7. The propulsion system of claim 6, wherein the motor case is rigidly secured to the rear bulkhead by releasable fasteners, enabling replacement of a fired motor case.

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